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PROCEEDINGS

OF

THE ROYAL IRISH ACADEMY.

1837. No. 6.

June 12.

Rev. B. LLOYD, D.D., Provost, T. C. D., President, in the Chair.

A paper was read, entitled, "An Inquiry into the Possibility of transplanting the Cornea, with the view of relieving Blindness occasioned by Diseases of that Structure." By Samuel Lenox Bigger, Esq.

The author stated that his expectation of succeeding in this operation had been first raised by the partial success attending an attempt which he had made, while a prisoner with a nomadic tribe of Arabs,—the subject of the operation being a gazelle. Having been thus led to inquire what had been done elsewhere to relieve or cure the opaque state of the cornea, Mr. Bigger found that the idea of performing the operation of transplantation had been entertained in Germany alone; that experiments had been made in that country, by Moesner, Reisinger, Schön, Drolshagen, Dieffenbach, and Thomé, with various results; but that Wutzer was the only person whose belief in the possibility of the operation led him to attempt it on the human subject,—an attempt in which he was unsuccessful, owing to the resistance of his patient.

The author then described the plan of operation which he had found most successful, and which had been hitherto untried. The results of several experiments performed according to this plan were then read. In a series of eighteen experiments, the iris was injured in ten; the crystalline lens escaped in eleven; union took place between the implanted portion and the adjacent parts in seventeen, in the space of forty-eight hours; in twelve, adhesion of the iris took place to some part of the cicatrix; sixteen were restored to imperfect vision; and in one, slough of the lambeau, and consequent destruction of the eye, occurred, the portion of cornea to be inserted having been detained half an hour before it was attached, in order to try how long it would retain vitality sufficient to enable it again to take on a vital action.

The author made several experiments with iodine, nitrate of silver, &c., and found that they were incapable of producing any effect on the milky state of the cornea, although they appeared to diminish the extent of the cicatrix; corrosive sublimate (in the proportion of from half a grain to three grains to the ounce of water) was the only medicinal substance tried which had the power of restoring absolute clearness to the implanted portion.

The author then mentioned the various means he had employed to produce absorption of the cicatrix, with their results; explained his view of the cases in which this operation might be attempted; and concluded by entreating those surgeons, who possessed hospitals, not to be too hasty in rejecting an operation, which, from the experiments detailed, and the living subjects exhibited, was now proved to be at least possible.

Mr. Bigger then made an oral communication on a series of experiments in which he was at present engaged, connected with the operations detailed in his paper. The object of these experiments was the removal of small spots of opaque lymph, where they existed in the centre of the cornea. The method employed consisted in passing a ligature through the opaque spot with a curved needle, which serves to fix the eye. Another needle is then passed at right angles to the former, and armed with a very fine ligature, which is allowed to remain loose. The first ligature being then strained, an incision is made equal in length to the nebulous portion; then raising it by the ligature, the whole opaque portion may be removed with a sharp curved scissors, and by drawing the ligature of reserve, the two fresh incised surfaces brought together.

Professor Kane read a paper "on the Composition of certain essential Oils."

The first object of the author, in commencing the examination of this subject, was to collect facts towards an approximate solution of the problem, "*whether there can be found any law connecting the composition of the secretions of plants of the same genus or natural family.*" The three alcaloids of the genus cinchona, giving the formulæ

$$R+O,\ R+2O,\ R+3O,$$

appear to furnish a glaring instance of the existence of such a law; but the want of connexion in the composition of the constituents of opium might be advanced in opposition, although not quite a parallel case. The family of the coniferæ appear well characterized by the presence of the hydrocarbon C_5H_4 and its oxides; but the same composition is found prevailing among the aurantiæ, as in oil of lemons,—the myrti, as in the neutral oil of cloves,—and the lauri, as in common camphor; whilst other members of the same family, as oil of cinnamon, have formulæ altogether different.

The members of the family of the labiatæ are characterized by yielding remarkably aromatic oils by distillation; and as many of these oils, from their use in medicine, are easily procured in commerce, Professor Kane considered that the determination of the composition of the products of certain members of a botanical group, whose natural connexion is among the best marked, might tend to throw some light upon the question at issue. He, therefore, examined the oils of the origanum vulgare, lavandula spica, mentha piperita, mentha puleghium, and mentha sativa. Great difficulty was found in obtaining the specimens so absolutely pure as to fit them for analysis, as all such oils contain small quantities of solid matters, (camphors of the essential oils, stearoptens,) which render impure the later products of the rectification.

Repeated analyses of the oil of the mentha puleghium, gave for its composition the same formula as for oil of turpentine, or oil of lemons, that is C_5H_4, or per cent.

	Theory.	Experiment.
Carbon	= 88,45	— 88,56
Hydrogen	= 11,55	— 11,87

Its boiling point is about 314° F., the same as that of turpentine.

The oil of mentha sativa, boiling at 320° F., gave, by several accordant analyses, the formula,

$C_{35}H_{28}O$ or $7\{C_5H_4\}+O$, and per cent.

	Theory.	Experiment.
Carbon	= 85,67	— 85,66
Hydrogen	= 11,15	— 11,38
Oxygen	= 3,18	— 2,96

The oil of the origanum vulgare, boiling at 324° F., gave as the result of five analyses, which varied very little from one another, the formula,

$C_{50}H_{40}O$ or $10\{C_5H_4\}+O$, and per cent.

	Theory.	Experiment.
Carbon	= 86,48 –	86,33
Hydrogen	= 11,27 –	11,44
Oxygen	= 2,25 –	2,23

These three oils, therefore, have the same hydrogen and carbon, and differ only in the two latter having absorbed small, but perfectly definite quantities of oxygen.

Oil of the lavendula spica, boiling at 365° F., gave as result, the formula $C_{12}H_{10}O$, or per cent.

	Theory.	Experiment.
Carbon	= 80,35 –	79,45
Hydrogen	= 10,90 –	11,30
Oxygen	= 8,75 –	9,25

The oil of peppermint had been analyzed by Blanchet and Sell, who obtained results, giving the formula $C_{12}H_{10}O$, which has been found above for oil of lavender. As their analyses were only two in number, and are given in the Journal de Pharmacie without any explanatory detail, Professor Kane thought it not superfluous to add to the above experiments a confirmation of their results. On purifying oil of peppermint of commerce, (having selected the foreign oil that it might be more probably what they had examined,) Professor Kane found that the more it was rectified and the earlier condensed the specimens analyzed were, the more the boiling point approached to 314°, and the composition to the formula C_5H_4. The difference between this result and that of Blanchet and Sell is too great to be explained by an error in the analyses of chemists whose other labours have shown such accuracy in quantitative research : Professor Kane accordingly thinks it not improbable, that there are two oils of peppermint of different compositions, and he is now occupied in seeking amongst the commercial samples for that with which the other chemists had been engaged.

Since the paper of which the preceding is an abstract was read, Professor Kane has examined the English oil of peppermint, which, when pure, has a density of 0,899, and boils at 365°. Its composition is

$$C_{25}H_{22}O_2 \text{ or } 5\{C_5H_4\}+H_2O_2 \text{ and per cent.}$$

$$\begin{array}{lllll} & & \text{Experiment.} & & \text{Theory.} \\ \text{Carbon} & = & 80{,}14 & - & \left.\begin{array}{r} 80{,}15 \\ 11{,}48 \\ 8{,}37 \end{array}\right\} 100. \\ \text{Hydrogen} & = & 11{,}76 & - & \\ \text{Oxygen} & = & 8{,}10 & - & \end{array}$$

This formula differs from Blanchet's in the hydrogen, which Blanchet's formula makes 10,9.

Oil of rosemary has been likewise examined, its density is 0,85, and it boils at 332°. It gave the formula,

$$C_{45}H_{38}O_2=9\{C_5H_4\}+H_2O_2 \text{ and per cent.}$$

$$\begin{array}{lllll} & & \text{Experiment.} & & \text{Theory.} \\ \text{Carbon} & = & 83{,}49 & - & \left.\begin{array}{r} 83{,}73 \\ 11{,}51 \\ 4{,}86 \end{array}\right\} 100{,}00. \\ \text{Hydrogen} & = & 11{,}66 & - & \\ \text{Oxygen} & = & 4{,}85 & - & \end{array}$$

The foreign oil of peppermint Professor Kane considers to be a mixture of nearly equal parts of genuine oil and of oil of turpentine; and hence the results obtained in its analysis as detailed above.

A paper "on Atmospheric Electricity" was then read by Edward S. Clarke, Esq.

The author having lately erected, at his residence near Palmerston, an apparatus adapted to observations on this subject, he exhibited to the Academy a drawing of the instrument. He stated, that in bringing the subject under the notice of the Academy, he had two objects in view,—the first, to compare the results of his experiments with those previously obtained by other observers; and the second, to induce others to erect similar instruments, feeling assured that contemporaneous observations would throw much light upon the subject.

The more important results obtained by Mr. Clarke during the past two months are :

1st. That atmospheric electricity in serene weather is invariably positive.

2nd. That it is more intense during fogs, especially if they occur during frosty weather.

3rd. That in cloudy weather, (without rain,) the aerial electricity diminishes in intensity.

4th. That during heavy rain, hail, snow, or sleet, (and particularly at their commencement,) the atmospheric electricity is very intense. This electricity is, at first, invariably negative, but sometimes changes its state frequently during the storm.

5th. That the periods of its diurnal changes of intensity vary considerably, the intensity being at a maximum (during the past two months) each day some time between 7½, A. M., and 10½, A. M. ; becoming almost evanescent at noon; and ascending progressively for a few hours previous to sun-set. It acquires its nocturnal maximum some time between 9 and 12, P. M.; when it again declines gradually until some hours after sun-rise.

6th. That the nocturnal electricity, with or without dew, is stronger than the diurnal.

The foregoing observations are for the most part confirmed by those of Cavallo. But, the sixth observation does not agree with those of Canton, Abbè Mazeas, M. De Saussure, and Mr. Cross; the two former observers not having observed any electricity at night, and the two latter finding it weaker than by day. M. De Saussure conceived the electricity of the evening to be strong in consequence of the dew acting as a conductor, whilst the author has observed it very strong when there was no dew. M. De Saussure has likewise stated the maximum of diurnal electricity to occur some hours after noon, it being also strong at noon; whilst Mr. Clarke usually found it almost evanescent at that period. These differences, the author conceives, may arise from difference of climate, or imperfect insulation of the instruments.

Mr. Clarke believes the electric intensity exhibited by the various clouds to be in the following order:

The nimbus, the cumulo-stratus, the cumulus, the stratus, the cirro-stratus, the cirro-cumulus, and the cirrus.

DONATIONS.

Asiatic Researches, Vol. XIX. Part 1. Presented by the Asiatic Society.

The London Medical and Surgical Journal, for April, 1837. Presented by the Editor.

June 26.

REV. B. LLOYD, D. D., Provost, T. C. D., President, in the Chair.

Matthew O'Conor, Esq., was elected member of the Academy.

Professor Liebig, of Giessen, was elected honorary member of the Academy.

A paper was read, " on a new Gaseous Compound of Carbon and Hydrogen." By Edmund Davy, Esq., F.R.S. &c., Professor of Chemistry in the Royal Dublin Society.

This compound was procured by the action of water on a black substance obtained by exposing a mixture of cream of tartar and charcoal powder to a strong heat in an iron bottle. The gas is highly inflammable, and when kindled in contact with air, it burns with a bright white flame, apparently denser and of greater splendour than even olefiant